REMARKS

Claims 27-44 were presented for examination and were pending in this application. In an Official Action dated November 5, 2003, claims 27-44 were rejected. Applicants thank Examiner for examination of the claims pending in this application and addresses Examiner's comments below.

Applicants herein amend claim 27. Claims 28 through 44 are cancelled without prejudice. New claims 45 through 90 are added. These changes are believed not to introduce new matter, and their entry is respectfully requested. The claim has been amended to expedite the prosecution of the application in a manner consistent with the Patent Office Business Goals, 65 Fed. Reg. 54603 (Sept. 8, 2000). In making this amendment, Applicants have not and do not narrow the scope of the protection to which Applicants consider the claimed invention to be entitled and do not concede that the subject matter of such claims was in fact disclosed or taught by the cited prior art. Rather, Applicants reserve the right to pursue such protection at a later point in time and merely seeks to pursue protection for the subject matter presented in this submission.

Based on the above Amendment and the following Remarks, Applicants respectfully request that Examiner reconsider all outstanding objections and rejections, and withdraw them.

Response to Rejections under 35 U.S.C. §102(e)

In paragraphs 1 through 3 of the Office Action, Examiner has rejected claims 27 through 44 under 35 USC § 102(e) allegedly as being anticipated by U.S. Patent No. 5,907,152 to Dandliker et al. ("Dandliker"). This rejection is now respectfully traversed.

Representative claim 27 has been amended to now recite:

> In an optical detection system housing a coherent light source for illuminating a surface, and an optical sensing assembly comprising at least one photosensitive array and at least one optical element, a method for detecting movement comprising:
>
> generating an illumination spot on the surface by lighting the surface with a coherent light beam from the coherent light source, the illumination spot providing optically back-scattered light off the surface;
>
> arranging each optical element to pass an image of the illumination spot onto each photosensor array associated with an optical element, the photosensor array having a plurality of pixels; and
>
> generating at least one image data signal from each photosensor array in response to the image on the plurality of pixels of that photosensor array, each image data signal comprising at least one image data point;
>
> storing a first image data signal;
>
> storing a second image data signal; and
>
> measuring similarity of images through the first image data signal and the second image data signal to obtain a displacement value, the displacement value indicative of detected movement.

The claimed invention beneficially scatters light from a coherent source off of a surface, through one or more optical elements and onto one or more photosensor arrays, in which each photosensor array is associated with an optical element. The claimed invention also generates at least one image data signal from each of the photosensors arrays and a first image data signal and second image data signal are stored to get a measure of similarity of images through the image data signals to determine a displacement value. Hence, by determining a displacement value in this manner the claimed invention can be advantageously used with an optical pointing device to determine movement relative to a surface. Applicants note that the cross-correlation function is disclosed throughout Applicants' specification, for example, beginning on page 24.

Referring now to the cited reference, Dandliker, it does not disclose the claimed invention. Dandliker discloses an optical detection system for use with an optical pointing device. (*See*, Dandliker, col. 1, ll. 22-27). However, the system disclosed in Dandliker operates differently than the claimed invention. Specifically, Dandliker discloses:

> the detection system of the present invention produces sinusoidal signals in quadrature for forward-backward detection using specially configured photodetectors. The detection system is sensitive to different directions of movement by the use of differently oriented detectors which use the same coherent illumination of the surface. More specifically, a first significant aspect of the invention is a quadruple comb array of photodetectors which senses a component (either x or y) of the movement and produces quasi sinusoidal quadrature signals. The sinusoidal properties of the signals produced by the [photodetectors] are obtained through optical matching by which the optical system is matched to the period of the photodetector array. Movement of the detector relative to the surface is then detected by a bi-directional counter in a manner similar to a rotational encoder. By combining a plurality of such quadrature encoders at different angles, motion in both the x and y directions can be detected. A microprocessor can be used to combine the signals from the various detectors. (Emphasis added)

Id., col. 2, ll. 41-59. That is, the system disclosed in Dandliker discloses a comb photodetection system that performs a comb function to determine displacement rather than Applicants' claimed measure of similarity, which recites having two images for comparison.

This comb structure is clearly illustrated in Figure 2 of Dandliker and described at col. 4, l. 8 to col. 6, l. 31. In particular, Dandliker states:

> Referring next to FIG. 2A, a comb photodetector which is a significant feature of the present invention is shown. In particular, the comb photodetector 50 comprises an array of photodetector elements 55A-55n arranged so that the output of every fourth element is connected together, forming what is essentially a quadruple array. The array may have an overall length L, a height S, and a distance A from the first to the fourth element, essentially forming the period of the array. For an exemplary embodiment, typical values of λ vary between 20 μm and 100 μm, while the value of L varies between 0.2 mm and 5 mm, and the value of S varies between 0.1 mm and 1 mm.

> The output 60 of the first group of elements may be represented as A+B sin ($2\pi x/\lambda$), while the output 65 of the second group can be represented as A+B cos ($2\pi x/\lambda$), while the output 70 of the third group can be represented as A-B sin ($2\pi x/\lambda$), and the output 75 of the fourth group can be represented as A-B cos ($2\pi x/\lambda$). The spectral and statistical properties of the detector signal depend on the size "s" of the speckles compared with the geometrical dimensions of the detector array. The comb array detector 50 acts as a spatial frequency filter where the filter characteristic for the differential detector signal [A+B sin ($2\pi x/\lambda$)] - [A-B sin ($2\pi x/\lambda$)] = 2B sin ($2\pi x/\lambda$) is shown in FIG. 2B.

Again, this citation clearly discloses use of a comb function in Dandliker rather than measuring a similarity of images in a manner as claimed by Applicants. This comb function in Dandliker provides periodic measurements in the spatial domain along a length, L, of the comb structure that, in turn, is used to measure a value for displacement.

In the Official Action on page 4, Examiner cites Dandliker at col. 5, l. 51 to col. 6, l. 65 as showing disclosure of a cross-correlation function. However, this citation does not disclose a cross-correlation function. Rather, this section of Dandliker discloses spatial filtering based on the topology and operation of the comb structure described above with respect to Figure 2A. Dandliker simply does not disclose measuring a similarity of images in a manner as Applicants' claim.

Hence, Applicants submit that the claimed invention is patentably distinquishable over the cited reference. Thus, Applicants respectfully request reconsideration of the basis of the rejection to 27 and withdrawal of that rejection. In addition, Applicants request allowance of claim 27 and its dependent claims at this time.

Additional Information

Applicants also note for Examiner submission of an Information Disclosure Statement and cited references with this Amendment and Response. Review of such references is requested and appreciated.

Conclusion

Applicants' have added new claims 45-68 that depend upon claim 27 and new claim set 69 through 90 for which Applicants request consideration and examination. Applicants respectfully submit that these are supported by the specification and are commensurate within the scope of protection to which Applicants' believe they are entitled.

In sum, Applicants respectfully submit that claims 27 and 45 through 90, as presented herein, are patentably distinguishable over the cited references (including references cited, but not applied). Therefore, Applicants request reconsideration of the basis for the rejections to these claims and request allowance of them.

In addition, Applicants respectfully invite Examiner to contact Applicants' representative if Examiner believes it will help expedite furtherance of this application.

RESPECTFULLY SUBMITTED,
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